Holt McDougal
Geometry, Geometry

Degree of Evidence regarding the Standards for Mathematical Practice:

Minimal Evidence

Summary of evidence:

1. **Make sense of problems and persevere in solving them**. In the chapters reviewed, there are few open-ended problems. Students are directed in how they should solve a particular problem, and then are asked to replicate the process in the practice problems. There is no opportunity for reflection on answers inherent in the student resource or mentioned in the teacher resource, aside from the occasional error analysis that the teacher could assign to students to complete. Overall, there are infrequent and limited open-ended problem-solving opportunities for students to tackle on their own. Most problems guide students in exactly how to reach the desired answer. There is very limited opportunity for students to create a problem-solving plan and follow through or determine reasonableness. Motivation for students to discover the concepts on their own is limited, because the formula is just presented to them as the rule to use.
2. **Reason abstractly and quantitatively**. There are some application problems ingrained in the unit. In the chapters reviewed, students are rarely, if ever, are asked to create a model for an application aside from the Geometry Labs. The teacher resource occasionally mentions "encouraging" students to work with a model, but it would be up to the teacher to implement. There is not much connection between applications and representations using symbols. Often, symbols just appear in formulas. Most questions are solved by applying an algorithm that the students have not generalized or formed on their own.
3. **Construct viable arguments and critique the reasoning of others**. In the chapters reviewed, there are limited opportunities for students to explain their reasoning. Problems are mainly focused on arriving at a numerical answer, with the occasional problem requiring an explanation or description. In the chapters reviewed, there is little mention of students sharing their methods with the class (e.g. p. 622), aside from in the teacher resource. Explanations and discussion of justification are very limited in the chapters reviewed. There are some "Critical Thinking" problems included in student practice that the teacher could use to foster student analysis and justification. Overall, there are limited opportunities for students to justify their thinking and when they do exist, they may be skipped due to infrequency or the fact that they are not in the practice exercises. Opportunities will rely on teacher facilitation of the activities and practice problems.
4. **Model with Mathematics**. In the chapters reviewed, students are rarely directed to create a model, unless students are completing one of the labs. In the application questions, answers are in context. There is no explicit connection among tables, graphs, equations, and situations in the chapters reviewed. Students have some opportunity to work with tables and equations in the labs, but these activities could be skipped because they are separate from the section lessons. The applications are more in the form of a closed word problem rather than being open-ended. There are some opportunities for students to create mathematical models, but these opportunities depend on teacher implementation and the incorporation of the Geometry Labs. Students are presented with how the book details they should solve a problem, and then they are tasked with practicing the use of the prescribed algorithm.
5. **Use appropriate tools strategically.** Geometric constructions are interspersed at various times in the text but not presented as a tool to help students in making sense of mathematical concepts. Students are asked to use rulers, protractors, patty paper, technology, and other materials to help

them in the exploration of some concepts, as presented in the Geometry labs interspersed in the text, but not inherent in the section examples. It would be up to the teacher to include these labs in the course to help students grapple with various tools. In the chapters reviewed, there is limited reference to the use of graphing calculators. Students are directed to use a calculator for trigonometry (e.g. p. 526), and screen shots are included. The use of technology is treated separate from the practice problems. Students are directed to use technology in some of the Geometry Labs and in the occasionally side bar. Technology use is separated out from the practice problems in the student resource, and it would be up to the teacher to implement. In the chapters reviewed, there is little evidence of evaluating the strength and weaknesses of tools.

6. **Attend to precision.** Examples use proper notation and are precise. Students are asked to conduct error analysis and to explain misconceptions through interspersed practice problems (e.g. p.258), but it is presented as a written communication rather than as a chance to talk about the mathematics with others. In the chapters reviewed, examples of precise communication are not present. Students are given some opportunities to share and discuss their responses, but this is only mentioned in the teacher resource (e.g. p.310). Overall, there is attention to precision in the examples but no discussion for students to tackle. The fostering precise communication relies on teacher facilitation of student activities presented in the teacher resource or in the labs.
7. **Look for and make use of structure**. In the chapters reviewed, there are few to no opportunities for students to look at examples and then generalize. Chapter 10 follows the pattern of giving students the formula, showing some examples using the formula, and then providing practice problems to complete on their own using the formula. The rule is always given and then worked-out examples follow (e.g. pp. 697,699, 705, 707, 708, etc.). The student resource does not contain any activities for students to explore patterns to create generalizations. The teacher resource suggests some activities that could be done in cooperative learning groups to help students make their own generalizations, but the activities are few and up to the teacher to implement (e.g. p.698). In the chapters reviewed, there is limited to no connection to prior learning. There are some opportunities for students to generalize their thoughts in the Think and Discuss sections, but this is primarily only after the text has told them the algorithm or rule without any discovery.
8. **Look for and express regularity in repeated reasoning.** In the chapters reviewed, students are rarely, if ever, asked to look at patterns and generalize on their own. Most of the time, the book shows them the pattern and then provides the formula (e.g. p.383, with Polygon Angle Sum Theorem). There are some Geometry Labs interspersed in the chapters that guide students to analyze and generalize their findings. Since the labs are not ingrained in the section examples themselves, they could be skipped. It would be up to the teacher to take the time to implement these activities, which are few. There are few to no opportunities for students to generalize a pattern to determine a rule. Opportunities to meet this standard would depend on the teacher taking the initiative to incorporate it into the course.